Immunization for Adults at High Risk

Missouri Immunization Coalition Webinar
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Disclaimer

The opinions expressed in this presentation are solely those of the presenter and do not necessarily represent the official positions of the Centers for Disease Control and Prevention

Disclosure

The presenter has no conflict of interest to disclose

Outline

- **Adult immunization schedule**
- **Adult vaccine cliques**
- **Risk-based review of vaccines**
  - Influenza
  - Pneumococcal
  - Tdap
  - Hepatitis B
  - Meningococcal
- **Adult immunization practice standards and strategies to improve adult immunization**

Adult Immunization Schedule

- **ACIP updates adult immunization schedule each year**
  - Represents current ACIP policy and updates approved policy changes from ACIP meetings
  - Adult immunization working group meets monthly, ongoing consultation with vaccine subject matter experts
- **Updates in adult immunization schedule approved by**
  - American College of Physicians
  - American Academy of Family Physicians
  - American College of Obstetricians and Gynecologists
  - American College of Nurse-Midwives
- **Adult immunization schedule published in**
  - *Annals of Internal Medicine* – in entirety
  - *MMWR* – announcement

Recommended Adult Immunization Schedule—United States - 2016

Note: These recommendations must be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

Figure 1. Recommended immunization schedule for adults aged 19 years or older, by vaccine and age group[1]

VACCINE ▼ / AGE GROUP ►	19-21 years	22-26 years	27-49 years	50-59 years	60-64 years	≥ 65 years
Influenza*,[2]	1 dose annually					
Tetanus, diphtheria, pertussis (Td/Tdap)*,[3]	Substitute Tdap for Td once, then Td booster every 10 yrs					
Varicella*,[4]	2 doses					
Human papillomavirus (HPV) Female*,[5]	3 doses					
Human papillomavirus (HPV) Male*,[5]	3 doses					
Zoster[6]					1 dose	
Measles, mumps, rubella (MMR)*,[7]	1 or 2 doses depending on indication					
Pneumococcal 13-valent conjugate (PCV13)*,[8]	1 dose					
Pneumococcal 23-valent polysaccharide (PPSV23)[8]	1 or 2 doses depending on indication					1 dose
Hepatitis A*,[9]	2 or 3 doses depending on vaccine					
Hepatitis B*,[10]	3 doses					
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)*,[11]	1 or more doses depending on indication					
Meningococcal B (MenB)[11]	2 or 3 doses depending on vaccine					
Haemophilus influenzae type b (Hib)*,[12]	1 or 3 doses depending on indication					

*Covered by the Vaccine Injury Compensation Program

- Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster
- Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)
- No recommendation

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967.

Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-6400.

Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 8:00 a.m. - 8:00 p.m. Eastern Time, Monday - Friday, excluding holidays.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians (AAFP), the America College of Physicians (ACP), the American College of Obstetricians and Gynecologists (ACOG) and the American College of Nurse-Midwives (ACNM).

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Tetanus, diphtheria, pertussis (Td/Tdap)*,3	Substitute Tdap for Td once, then Td booster every 10 yrs					
Varicella*,4	2 doses					
Human papillomavirus (HPV) Female*,5	3 doses					
Human papillomavirus (HPV) Male*,5	3 doses					
Zoster6					1 dose	
Measles, mumps, rubella (MMR)*,7	1 or 2 doses depending on indication					
Pneumococcal 13-valent conjugate (PCV13)*,8	1 dose					
Pneumococcal 23-valent polysaccharide (PPSV23)8	1 or 2 doses depending on indication					1 dose
Hepatitis A*,9	2 or 3 doses depending on vaccine					
Hepatitis B*,10	3 doses					
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)*,11	1 or more doses depending on indication					
Meningococcal B (MenB)11	2 or 3 doses depending on vaccine					
Haemophilus influenzae type b (Hib)*,12	1 or 3 doses depending on indication					

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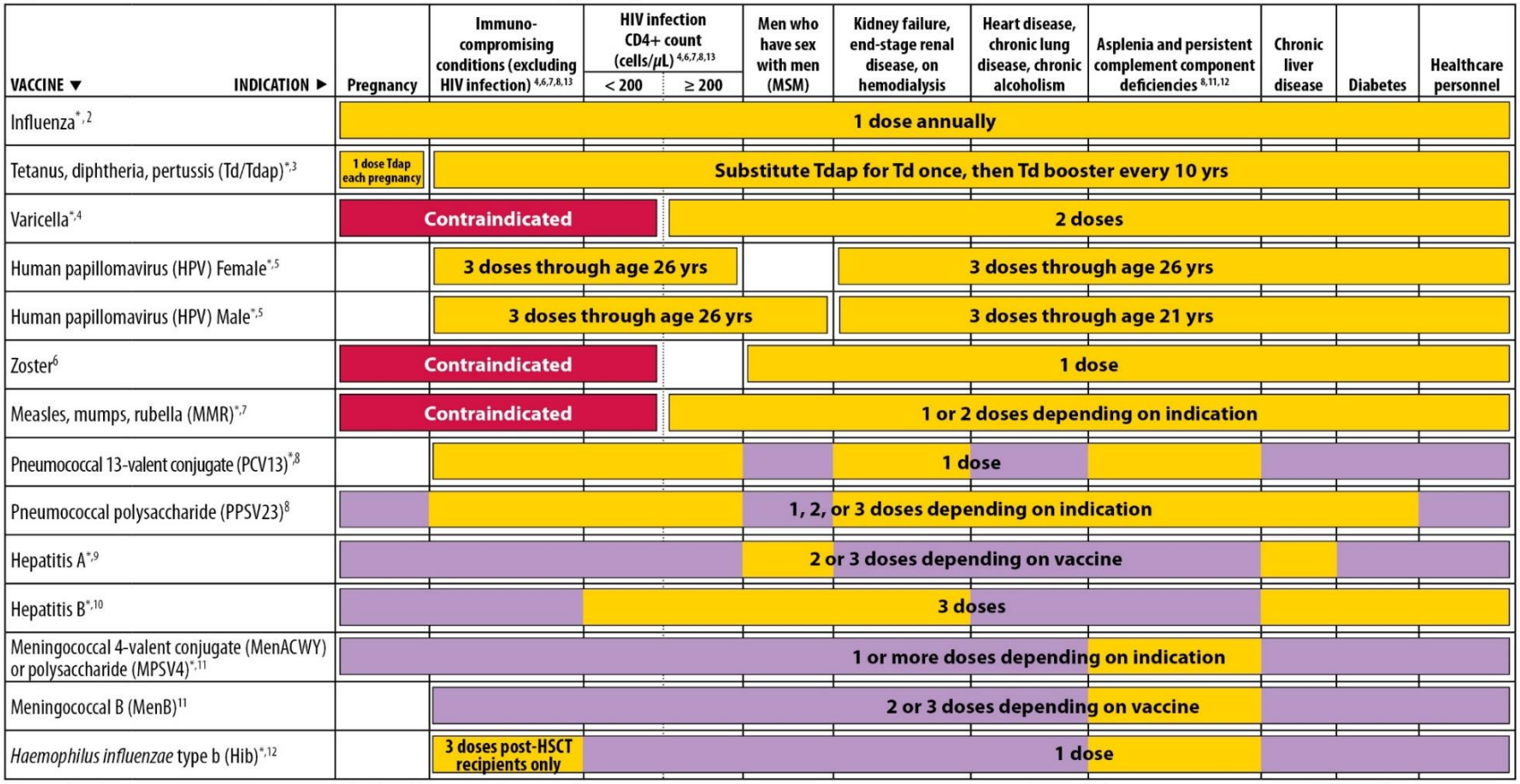
Figure 2. Vaccines that might be indicated for adults aged 19 years or older based on medical and other indications[1]



*Covered by the Vaccine Injury Compensation Program

Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster

Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)

No recommendation

Contraindicated

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly recommended for adults aged ≥19 years, as of February 2016. For all vaccines being recommended on the Adult Immunization Schedule: a vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/hcp/acip-recs/index.html). Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Adult Vaccine Cliques

Routine

- Influenza
- Pneumococcal
- Tdap
- Zoster

Selective

- HPV
- MMR
- Varicella
- Meningococcal
- Hepatitis A
- Hepatitis B

Case Study: Earl Lee Riser

- Mr. Riser is 36 yo man, history of diabetes and hypertension, splenectomy at age 18 after car accident, seen in STD clinic today
- Has documented childhood vaccines, last record in state immunization registry was Td booster at age 18
- *Which vaccines should you strongly recommend that he receive?*

Routine

- Influenza
- Pneumococcal (PCV13 and PPSV23)
- Tdap

Selective

- Hepatitis B
- Meningococcal (MenACWY and MenB)
- MMR
- Hib

Influenza – Health Impact

- Influenza disease burden varies year to year
  - Millions of cases
  - Average of 226,000 hospitalizations annually
  - 3000–49,000 deaths annually, >90% among adults
- Direct medical costs in U.S. ~$10.4 billion, add in loss of work and life ~$87 billion
- Vaccination prevented
  - 7+ million illnesses
  - 3+ million medically attended illnesses
  - 90,000+ hospitalizations

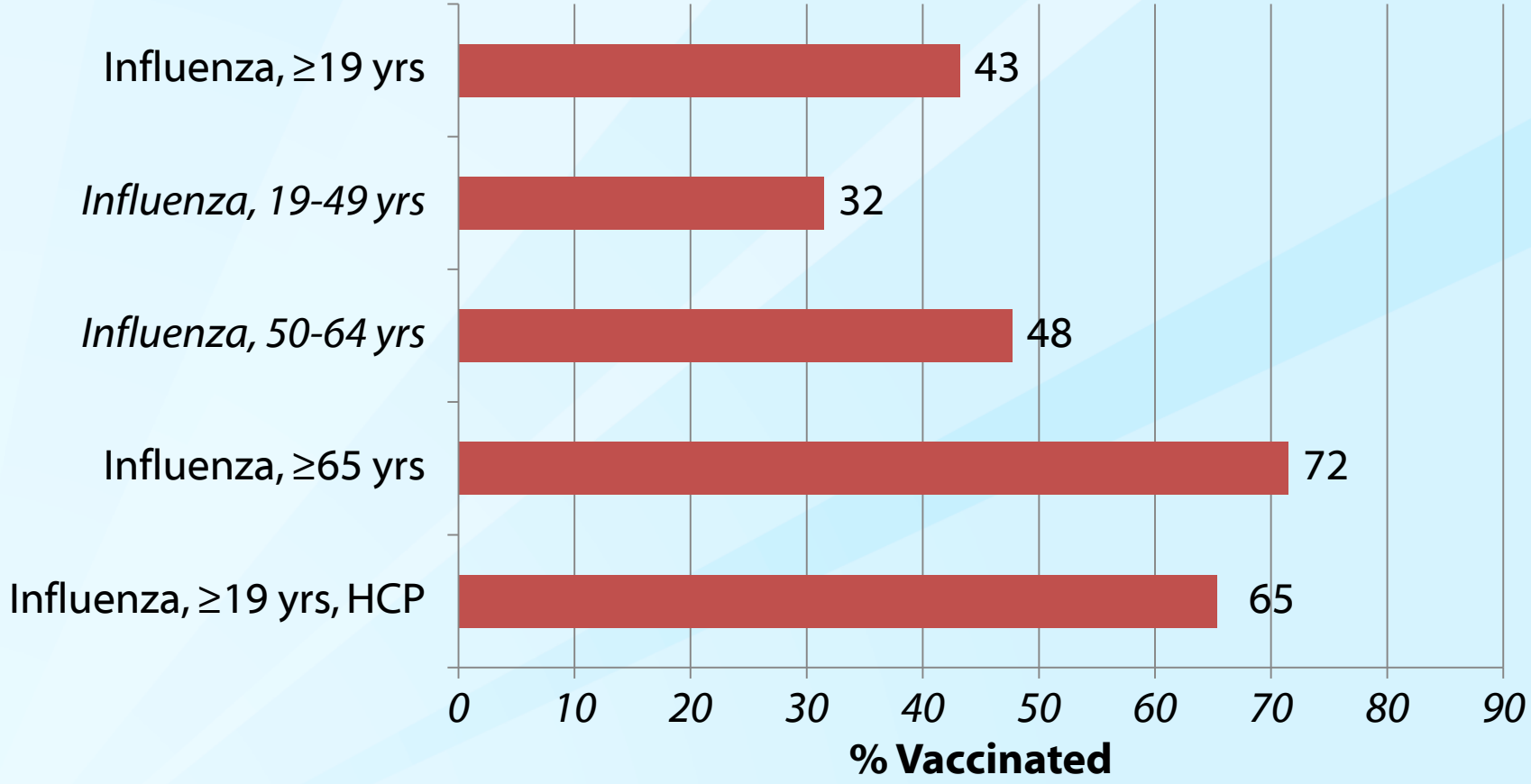
1. Thompson WW, et al. Influenza-Associated Hospitalizations in the United States. JAMA 2004; 292:1333-1340
2. CDC. Estimates of deaths associated with seasonal influenza –United States, 1976-2007. MMWR. 2010;59(33):1057-1062
3. Molinari, et al. The annual impact of seasonal influenza in the US: Measuring disease burden and costs. *Vaccine*2007;25:5086–5096
4. Reed, et al. Estimated Influenza Illnesses and Hospitalizations Averted by Vaccination —United States, 2013–14 Influenza Season *MMWR* 2014:63(49);1151-1154

Influenza Vaccine Priorities

- **All persons age ≥6 months**
- **Healthcare workers**
  - High risk for disease (symptomatic and asymptomatic)
  - High risk for transmission
  - High impact – if sick, not available to work
- **Patients at highest risk – severe illness or spread**
  - Pregnant women
  - Newborns and children < 2 years
  - Elderly
  - Medical comorbidities (including obesity)
  - Household contacts of high-risk
  - Long-term care/institutionalized, crowded living conditions

http://www.cdc.gov/vaccines/pubs/vis/downloads/vis-flu.pdf

Adult Influenza Vaccination Coverage by Age, 2013-14 season, United States, 2014 NHIS



- HP2020 Targets: 70% ≥19 years, 90% HCP ≥19 years
- BRFSS estimates for 2013-14: 42.2% (18+), 32.2% (18-49), 45.3% (50-64), 65.0% (65+)
- HCP internet panel survey 2013-14: 75.2%

Influenza Vaccination Coverage Among U.S. Adults 2011-12, 2012-13, and 2013-14 Seasons

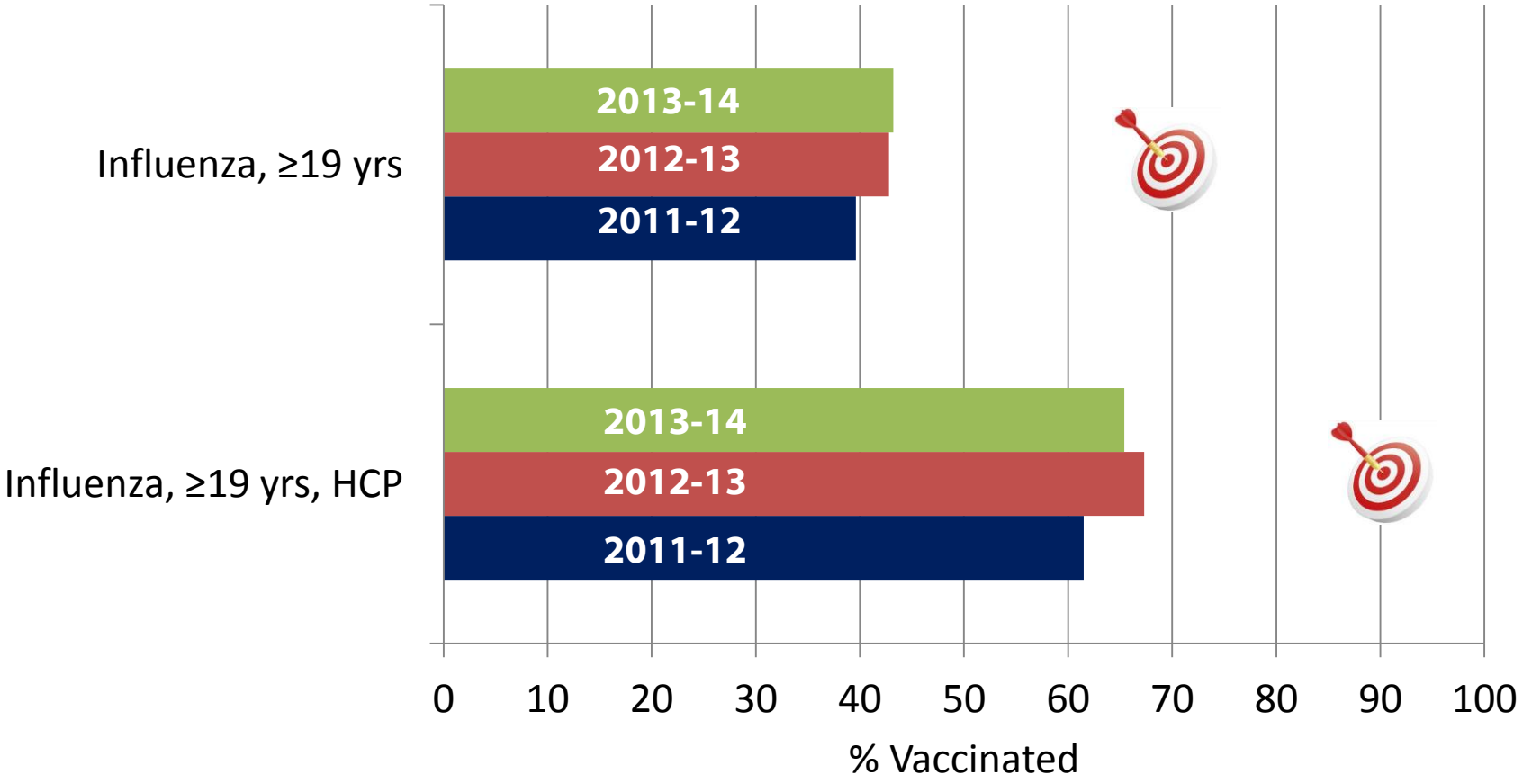
Group	2011-12 (%)	2012-13 (%)	2013-14 (%)*	Difference (%)
Persons ≥18 yrs	**38.8**	**41.5**	**42.4**	**3.6**
Persons 18-49 yrs, all	28.6	31.1	32.3	3.7
Persons 18-49 yrs, high risk	36.8	39.8	38.7	1.9
Persons 50-64 yrs	42.7	45.1	45.3	2.6
Persons ≥65 yrs	64.9	66.2	65.0	0.1

Health People Target 70% for all adults

Estimates of the percentage of people vaccinated are based on interviews conducted beginning September (BRFSS) or October (NIS) 2013 through June 2014 and reported vaccinations from July 2013 through May 2014. For California, BRFSS interview data were only available for September-December 2013 and thus estimates for persons ≥18 years only reflect vaccinations during July-November 2013. For Mississippi, sample size was insufficient from interviews conducted April-June 2014 to estimate vaccinations past the end of February, 2014 for persons ≥18 years.

http://www.cdc.gov/flu/fluvaxview/index.htm

Adult Influenza Vaccination Coverage, by Age, United States



HP2020 Targets: 70% ≥19 years, 90% HCP ≥19 years

Data Source: 2011, 2012, 2013 and 2014 NHIS

Pneumococcal Disease and Vaccines

- Invasive pneumococcal disease (IPD)
  - Bacteremia, sepsis, meningitis
  - ~40,000 cases, 86% among adults
  - ~4000 deaths, almost all among adults
- PPSV23 prevents IPD
  - 60-70% efficacy
  - Only 21% IPD strains in immunocompromised adults
- PCV13 prevents IPD and pneumonia
  - Adults ≥65y
  - Adults ≥19y with immunocompromise, asplenia, CSF leak or cochlear implant

Pneumococcal Immunization

HIGH Risk

Adults ≥65y

Immunocompromised, anatomical or functional asplenia, CSF leak, cochlear implant

PCV13 + PPSV23

INCREASED Risk

Chronic medical conditions (not immunocompromised)

Smokers

PPSV23

AVERAGE Risk

Adults <65y with no chronic medical conditions

None

Immunocompromised Adult

Should receive PCV13 and PPSV23

1. Disease
   - Cancer (e.g., hematologic malignancies, multiple myeloma)
   - Acquired immunodeficiency (e.g., HIV)
   - Congenital immunodeficiency (e.g., complement deficiencies)
   - ESRD, nephrotic syndrome
2. Iatrogenic
   - Long-term corticosteroids, radiation
   - Transplants (solid organ)
3. Asplenia
   - Anatomical (splenectomy)
   - Functional (hemoglobinopathy, sickle cell)

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6140a4.htm
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6337a4.htm

Pneumococcal Vaccination Recommendations in 2016 Adult Immunization Schedule

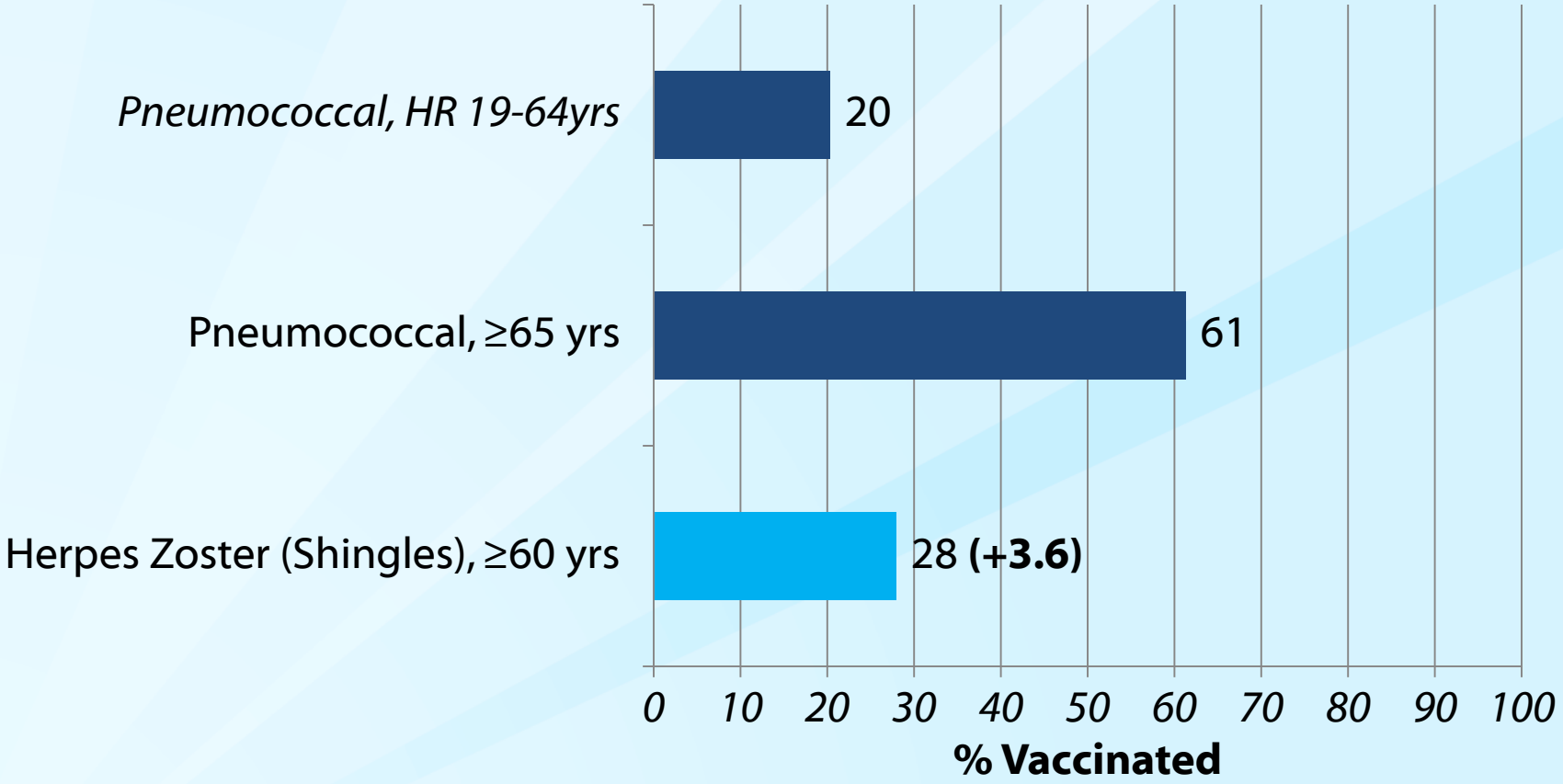
Adults ≥65 years	
▪ Have not received PCV13 or PPSV23, or unknown history	PCV13 → PPSV23[1]
▪ Have not received PCV13 but received PPSV23 at ≥65y	PCV13[3]
▪ Have not received PCV13 but received ≥1 PPSV23 at 19–64y	PCV13[3] → PPSV23[1,4]
▪ Have received PCV13 but not PPSV23 at 19–64y	PPSV23[1]
▪ Have received PCV13 and ≥1 PPSV23 at 19–64y	PPSV23[1,4]
Adults ≥19 years immunocompromised, asplenia	
▪ Have not received PCV13 or PPSV23, or unknown history	PCV13 → PPSV23[2] → PPSV23[4]
▪ Have not received PCV13 but received 1 dose PPSV23	PCV13[3] → PPSV23[2,4]
▪ Have not received PCV13 but received 2 doses PSV23	PCV13[3]
▪ Have received PCV13 but not PPSV23	PPSV23[2] → PPSV23[4]
▪ Have received PCV13 and 1 dose PPSV23	PPSV23[4]
Adults 19–64 years	
▪ CSF leaks, cochlear implants	PCV13 → PPSV23[2]
▪ Chronic health conditions	PPSV23
▪ Smoke cigarettes	PPSV23

[1] ≥1y after PCV13
[2] ≥8 wks after PCV13
[3] ≥1y after most recent PPSV23
[4] ≥5y after most recent PPSV23

NHIS 2014 Definition of High Risk for Pneumococcal Disease

- **Adults considered at high risk if told by doctor or other healthcare professional that they**
  - Ever had:
    - Diabetes mellitus
    - Emphysema
    - Chronic obstructive pulmonary disease (beginning in 2012)
    - Coronary heart disease, angina, heart attack, other heart condition
    - Lymphoma, leukemia, or blood cancer
  - Had during preceding 12 months:
    - Cancer diagnosis (excluding non-melanoma skin cancer)
    - Asthma episode or attack
    - Chronic bronchitis
    - Weak or failing kidneys
- **Current smokers**

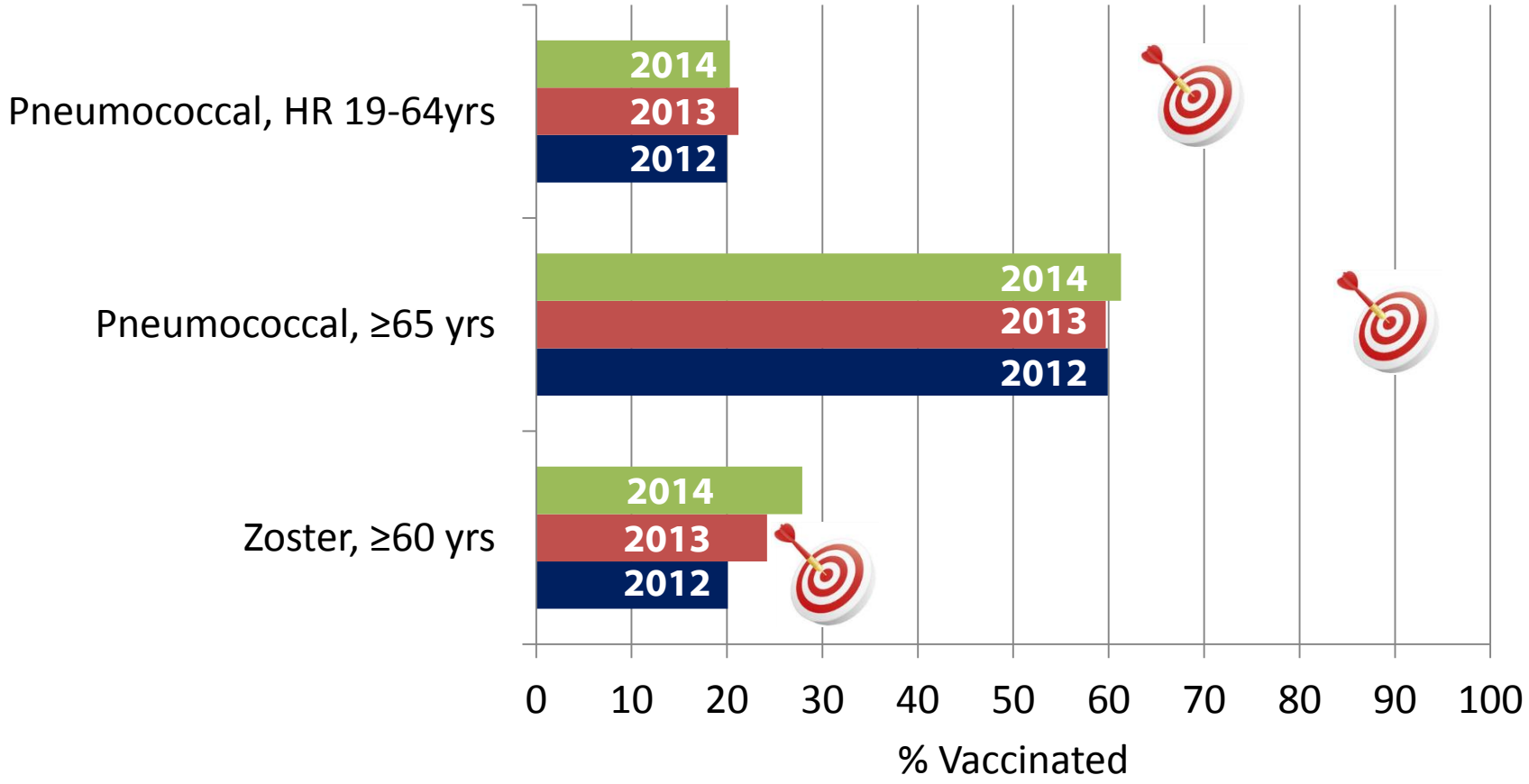
Adult Vaccination Coverage, Selected Vaccines by Age and High-risk Status, United States



HP2020 Targets: 60% PPV HR 19-64 years, 90% PPV ≥65 years, 30% Shingles

Data Source: 2014 NHIS

Adult Immunization Coverage, Selected Vaccines by Age and High-risk Status, United States



HP2020 Targets: 90% PPV ≥65 yrs, 60% PPV HR 19-64 yrs, 30% zoster ≥60 yrs

Data Source: 2012, 2013 and 2014 NHIS

Pertussis (Whooping Cough)

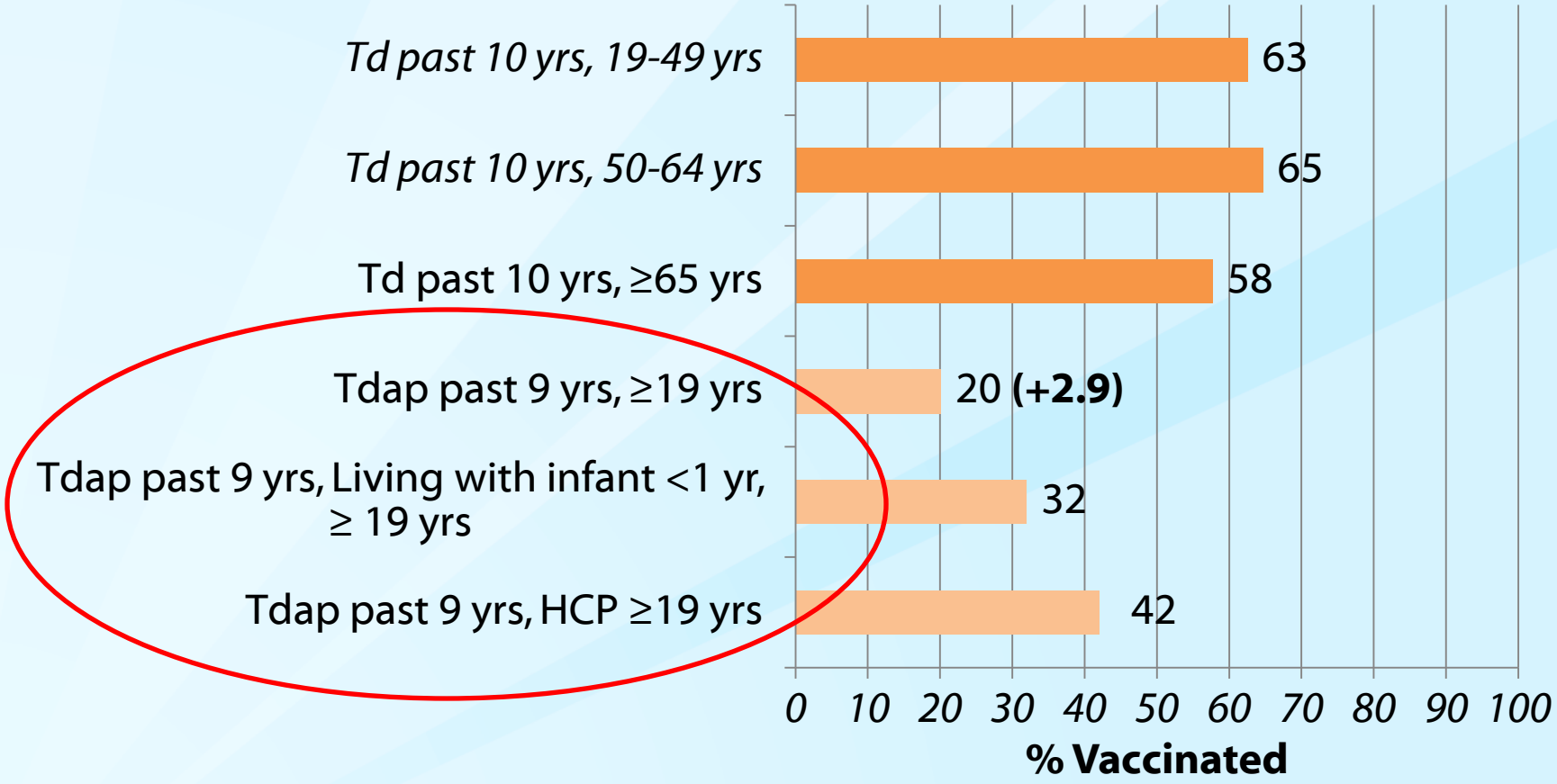
- **Burden**
  - ~28,000 cases per yr for 2013 and 2014
  - ~9000 among adults
- **Vaccination**
  - Adults ≥65y close contact with infant <12 mos should receive Tdap for protection against pertussis and reduce likelihood of transmission
  - Adults with or without medical conditions should receive Tdap in place of Td, then Td booster every 10 yrs; may give <10y following last Td
  - Pregnant women should receive Tdap during each pregnancy (preferably during 27-36 weeks gestation)

Tdap Vaccination Coverage during Pregnancy

- **Internet Panel Survey, 2013-2014**
  - Vaccinated during pregnancy: 14.4%
- **Vaccine Safety Datalink sites, 2012**
  - Vaccinated during pregnancy: 13.7%
- **Michigan Medicaid, 2011-2013**
  - Vaccinated during pregnancy: 14.3%

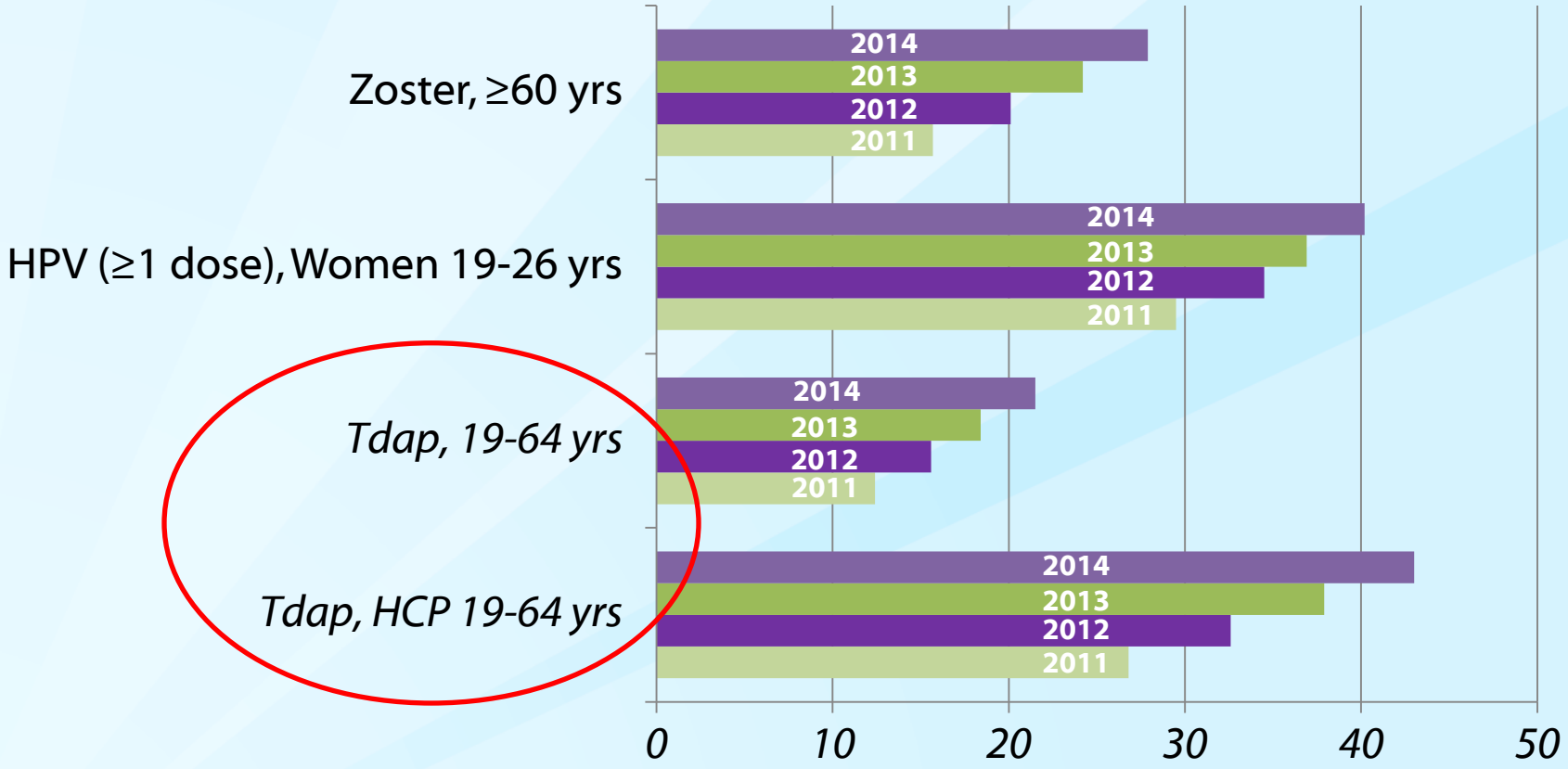
Internet Panel Survey: Tdap vaccination coverage assessed in April 2014 among women recruited from a general population opt-in internet panel who were currently or recently pregnant anytime during August 2013-March 2014. Assessment Branch/Immunization Services Division/NCIRD/CDC, unpublished data
Vaccine Safety Datalink sites: Tdap coverage assessed after end of pregnancy among women with continuous insurance coverage enrolled in seven Vaccine Safety Datalink sites. Karbanda EO et al. PrevMed. 2014;67:316-9
Michigan Medicaid: Tdap coverage during pregnancy assessed from Medicaid claims data among women who delivered their first live-born infant during November 2011-February 2013. Housey M et al. MMWR 2014;63:839-42
Pregnancy Risk Assessment Monitoring System (PRAMS): Tdap coverage among women who had a live birth during September-December 2011. Ahluwalia IB et al. Data to be published in MMWR on May 22, 2015

Adult Tetanus-containing Vaccination Coverage by Age and High-risk Status, United States



Data Source: 2014 NHIS

Adult Vaccination Coverage
Selected Vaccines with Increases from 2011 to 2014



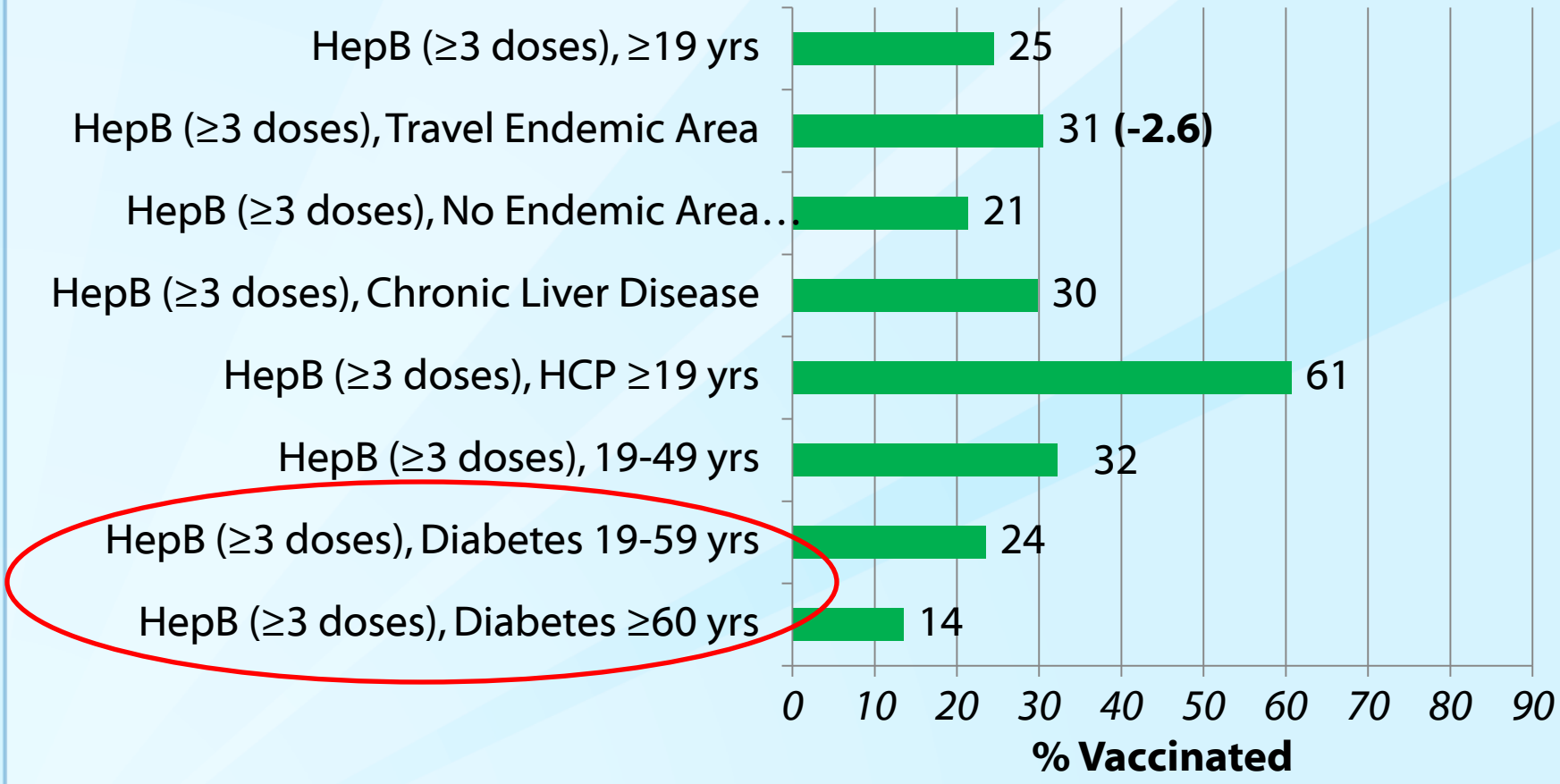
Data Source: NHIS 2011-2014

Hepatitis B and Diabetes

- **Hepatitis B disease burden**
  - ~700,000–1.4 million persons infected with HBV in U.S.
  - HBV infection acute→chronic ~5%, but higher among older adults with diabetes
  - Chronic HBV infection leads to cirrhosis and liver CA ~15% affected adults
- **Adults with diabetes should receive hepatitis B vaccine**
  - Adults 19–59 years
  - Age ≥60y at discretion of treating physician
- **Increased risk and higher morbidity**
  - Patients with diabetes have 2.1x risk for acute HBV compared with non–diabetes
  - NHANES: Seroprevalence for HBV (anti-HBcAg) 60% higher in diabetics than non-diabetics
  - Nonalcoholic steatohepatitis more common in diabetics, and NASH and other chronic liver disease increases HBV-associated morbidity

http://www.cdc.gov/mmwr/pdf/wk/mm6050.pdf

Hepatitis B Vaccination Coverage by Age and High-risk Status, United States



HP2020 Target: 90% HepB Healthcare Personnel (HCP)

Data Source: 2014 NHIS

Meningococcal Disease

- **Burden of meningococcal disease**
  - Caused b Neisseria meningitides: meningitis (50%), bacteremia (38%), bacteremic pneumonia (9%)
  - Low incidence 0.18 per 100,000
  - Rare but serious: ~50–60 cases, 5–10 deaths annually
  - >80% among age 16–23
  - Serogroup B disease among age 18–23: 0.14 per 100,000
- **Meningococcal vaccines**
  - MenACWY – age ≤55y at increased risk, and age ≥56y previously vaccinated with MenACWY and need revaccination or multiple doses anticipated
  - MPSV4 – preferred for adults age ≥56y previously not vaccinated with MenACWY and need single dose only
  - MenB – age ≥10y at increased risk

Meningococcal Vaccination

- **Recommended for**
  - Asplenia or complement deficiencies
  - Microbiologists
  - Outbreak settings
- **Category B recommendation for MenB vaccine**
  - "Young adults aged 16–23 years (preferred age 16–18 years) may be vaccinated to provide short-term protection against most strains of MenB disease"

Other Vaccines to Consider for Mr. Riser

- **MMR – not needed**
  - Born in 1957 or later – need 1 dose
  - Post-secondary school, work in healthcare, travel internationally – need 2 doses
- **Hib - need**
  - Asplenia – need 1 dose
- **Indications for vaccines based on risk due to**
  - Age – HPV, zoster (neither appropriate for Mr. Riser)
  - Pregnancy – influenza, Tdap (neither appropriate for Mr. Riser)
  - Occupation – hepatitis A/B, MMR for healthcare workers
  - Travel – hepatitis A/B, MMR
  - Other – hepatitis A/B for MSM

Adult Immunization Practice Standards

- All providers, including those who don't provide vaccine services, have role in ensuring patients up to date on vaccines
- Call to action for healthcare professionals to
  - Assess immunization status of all patients at every clinical encounter
  - Strongly recommend vaccines that patients need
  - Administer needed vaccines or refer to a provider who can immunize
  - Document vaccines received by patients in state vaccine registries

- ☐ Assess
- ☐ Recommend
- ☐ Administer or refer
- ☐ Document

Public Health Reports, March–April 2014
www.publichealthreports.org/issueopen.cfm?articleID=3145

Evidence-Based Strategies to Improve Adult Immunization Rates

- **Systemic offering and recommendations from clinicians result in higher uptake**
  - **Can reduce racial and ethnic disparities in vaccine coverage**
- **Immunization Information Systems (IIS), commonly known as "vaccine registries"**
  - **Increase accuracy of vaccine assessment**
  - **Support reminder and recall interventions**
  - **Facilitate provider assessment/feedback**

Hurley, et al. Annals of Internal Medicine, 2014

Opportunities to Improve Adult Immunization

- Adults not aware there are vaccines recommended for adults… **but most patients will accept vaccines if recommended by trusted healthcare provider**
- Healthcare providers for adults too busy and have competing priorities… **but primary care providers think immunizations are important for their patients**
- Not all providers stock all vaccines for adults… **but there is increasing access to vaccines**
- Adults frequently see multiple providers and recordkeeping is difficult… **but state vaccine registries include adult immunizations**
- **Most insurance covers vaccines for adults** – particularly important to reach newly insured who may not be aware of vaccination benefits

Hurley, et al. Annals of Internal Medicine, 2014
Guide to community preventive services: www.thecommunityguide.org/vaccines/index.html
Adult non-influenza vaccine coverage: www.cdc.gov/mmwr/preview/mmwrhtml/mm6305a4.htm

Summary

- **Adult immunization schedule**
- **Risk-based review of vaccines needed by Earl Lee Riser**
  - Influenza
  - Pneumococcal
  - Tdap
  - Hepatitis B
  - Meningococcal
  - Other
- **Adult immunization practice standards and strategies to improve adult immunization**

Adult Immunization Resources

- **CDC**
  www.cdc.gov/vaccines/adultstandards
  www.cdc.gov/vaccines/schedules/hcp/adult.htm
- **National Adult and Influenza Immunization Summit and Immunization Action Coalition (IAC)**
  www.izsummitpartners.org
- **National Foundation for Infectious Diseases**
  www.adultvaccination.org
- **National Adult Immunization Coordinators' Partnership (NAICP)**
  www.izsummitpartners.org/naicp/
- **Association of Immunization Managers (AIM)**
  www.immunizationmanagers.org